SPACE SCIENCE SUMMER STUDY
SPACE SCIENCE BOARD
National Academy of Sciences

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29 June 1962

Dr. W. W. Kellogg
Vice-Chairman
Space Science Summer Study
State University of Iowa
Iowa City, Iowa

Dear Dr. Kellogg:

In the course of deliberations of the Biology Working Group, the wisdom of our current policy regarding sterilization of space vehicles has been examined. The Group has considered this matter very carefully because the present state of our knowledge of conditions which prevail on Mars is such that we cannot rule out the possible existence of life on that planet. Also some indirect evidence can be construed as indicative of the actual presence there of living matter. The Group held the opinion that protecting Mars from contamination by terrestrial organisms through the impact of a space vehicle must be assured. If we fail to take the necessary precautions to avoid deliberate contamination or to sufficiently minimize the chance of accidental contamination of Mars during the early phases of exploration, we may destroy what could be mankind's unique opportunity to identify our only accessible extraterrestrial biota. Because of the risk of bungling a once-in-the-solar-system opportunity, it seems patently clear that our policy of spacecraft sterilization should be realistic and that it should be enforced.

In order that our national policy shall be realistic, it is necessary to ask first whether sterilization of a space vehicle is achievable and second what will be the cost. I understand that a probability of one in a million is stated as the objective of our sterilization program. I suppose that this probability represents the calculated chance of any particular vehicle being capable of depositing a viable terrestrial organism on the surface of Mars, but I do not know how this statistic was arrived at, what error should reasonably be associated with it, or particularly what quality control procedures will be used to determine whether the desired standard has been achieved.

Assuming that a meaningful procedure has been or can be worked up for meeting appropriate quality control specifications regarding sterility -- whether it is to be the current limit of $1/10^6$ or some other figure (based on a revised policy) -- it is necessary to estimate the cost of our space vehicle sterilization program. We need this estimate because, if the cost should turn out to be intolerably large, that must be taken into consideration as we re-examine our policy regarding sterilization. I appreciate that the cost may not be estimated easily because it includes various items difficult to translate into dollar value. Nevertheless some estimates can be made and probably have been made. I think we need to know what they are.

I have discussed these matters not only with members of the Biology Working Group but also with Dr. Phil Abelson who as you know also is concerned with the basis for our current sterilization policy. We agreed that NASA should be asked to provide specific information on its sterility control limit, on the quality control procedures whereby the standard is achieved, and on the costs to be anticipated for this program.

Since it does not seem possible to bring this matter to the further attention of the Biology Working Group due to the shortage of time, I propose that an ad hoc committee be convened later during the Summer Study and that NASA representatives be asked to provide the committee with the requested information. If you agree with this method of furthering our consideration and evaluation of the sterilization program, I shall be glad to cooperate by suggesting names of competent scientists who might serve on the ad hoc committee. I understand that the latter part of the week of July 23 would suit Dr. Abelson's schedule.

Sincerely,

Allan H. Brown
Chairman

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